

Interactive-Multimedia Teaching of Medical Sciences in the 21st Century: The Temporo-Mandibular Joint.

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The technological revolution which has occurred over the last ten years in the field of computer sciences leads one to wonder about the future roles of teachers and students. In the light of this rapid change, one must also consider what the basic sciences curriculum in medicine and dentistry of the future will be; conventional course format or a different format? Should we consider replacing conventional laboratories with electronic presentations? Should we be scanning our documents (x-rays, texts, slides, etc....) for our files? Shouldn't we be placing computers in our university clinics? Let us not forget health professionals in private practice, many of whom already have personal computers in their offices. These could be used for their continuing education if equipped with computerized courses, many of which are already available. We believe that future education in medicine and dentistry must necessarily follow this course and we should be prepared for it in advance.

We can now create digital documents containing a number of divers presentation modes such as images, illustrations, photographs, animation, video, sounds, music, etc., which can be viewed and consulted independently by any user, through self-paced interactive structures "playable" on personal computers.

In the last five years, progress in information technology and the globalization of the industry has touched every corner of the world. This technological revolution has influenced all aspects of our daily lives, and the field of education has certainly not managed to escape this current. University level education in all domains has been particularly affected by this change. We believe that we have arrived at a point of no return and must continue in this direction in the 21st century. Are changes in medical and dental schools' curricula following this trend with enough force?

In order to prove the necessity of preparing such multimedia documents for the future generation, we prepared an interactive multimedia courseware on the Temporo-Mandibular Joint. The courseware is on CD-ROM, multilingual (English/French) and for both platforms (Mac and PC/Compatible). We chose the TMJ because of its clinical implications and the difficulties in diagnosing its syndromes. We also

wanted to introduce the student to basic sciences' components of the joint and to show on the computer screen, all the latest imaging technologies in this domain.

The design of the instruction consists of a tutorial presenting the following chapters: Introduction, Osteology, Soft Tissues, Physiology, Pathology, Imaging and a self-assessment module in which the student can test his/her knowledge by going through several multiple choice and short answer questionnaires based on the textual content of the tutorial, as well as visual material, i.e. anatomical dissection material and several X-Ray images.

Besides the facility of access to dissecting room material and osteological specimens, the instruction is supported by animations & digital video clips as well as audio material, like the different physiological and pathological noises of the joint during the movements of the jaw. Medical illustrations are also included to present anatomical structures from the skin surface to the joint level, layer by layer, exposing structures in-between.

Aiming toward future implementation of computed-assisted instruction as a standard learning and teaching tool, this self-paced courseware was provided with monitoring options to provide each student with information about his/her progress, and giving them additional and useful help to reach the instructional objectives, thus mastering the subject-matter, with several user controlled options.

This monitoring is initiated by the user personalizing its usage of the courseware with a user name and a password. The users' activities are then monitored and recorded for later use and reference: which sections are accessed (which ones have not yet been seen). The user controlled options consists of the opportunity to take notes while using the courseware, which can be retrieved or printed at a later time. Bookmarks can be inserted and results from the different questionnaires are retrievable to evaluate the student's progress. The software can also list sections of the courseware where questions have been missed.

All pertinent information is stored in external files that we are using to conduct research in the field of educational technology, in regards to user's navigational patterns and usage of provided options.